



SEQUENCE LISTING

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<120> BACTERIAL PHEROMONES AND USES THEREFOR

<130> 49946-60261

<140> 09/445,289
<141> 2000-05-11

<150> PCT/GB98/01619
<151> 1998-06-03

<150> GB 9711389.8
<151> 1997-06-04

<150> GB 9811221.2
<151> 1998-05-27

<160> 62

<170> PatentIn Ver. 3.2

<210> 1
<211> 362
<212> PRT
<213> Mycobacterium tuberculosis

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Gly Thr Ala Met Arg Val Thr Thr Met Lys Ser Arg Val Ile Asp Ile
35 40 45
Val Glu Glu Asn Gly Phe Ser Val Asp Asp Arg Asp Asp Leu Tyr Pro
50 55 60
Ala Ala Gly Val Gln Val His Asp Ala Asp Thr Ile Val Leu Arg Arg
65 70 75 80
Ser Arg Pro Leu Gln Ile Ser Leu Asp Gly His Asp Ala Lys Gln Val
85 90 95
Trp Thr Thr Ala Ser Thr Val Asp Glu Ala Leu Ala Gln Leu Ala Met
100 105 110
Thr Asp Thr Ala Pro Ala Ala Ser Arg Ala Ser Arg Val Pro Leu
115 120 125

Ser Gly Met Ala Leu Pro Val Val Ser Ala Lys Thr Val Gln Leu Asn
 130 135 140
 Asp Gly Gly Leu Val Arg Thr Val His Leu Pro Ala Pro Asn Val Ala
 145 150 155 160
 Gly Leu Leu Ser Ala Ala Gly Val Pro Leu Leu Gln Ser Asp His Val
 165 170 175
 Val Pro Ala Ala Thr Ala Pro Ile Val Glu Gly Met Gln Ile Gln Val
 180 185 190
 Thr Arg Asn Arg Ile Lys Lys Val Thr Glu Arg Leu Pro Leu Pro Pro
 195 200 205
 Asn Ala Arg Arg Val Glu Asp Pro Glu Met Asn Met Ser Arg Glu Val
 210 215 220
 Val Glu Asp Pro Gly Val Pro Gly Thr Gln Asp Val Thr Phe Ala Val
 225 230 235 240
 Ala Glu Val Asn Gly Val Glu Thr Gly Arg Leu Pro Val Ala Asn Val
 245 250 255
 Val Val Thr Pro Ala His Glu Ala Val Val Arg Val Gly Thr Lys Pro
 260 265 270
 Gly Thr Glu Val Pro Pro Val Ile Asp Gly Ser Ile Trp Asp Ala Ile
 275 280 285
 Ala Gly Cys Glu Ala Gly Asn Trp Ala Ile Asn Thr Gly Asn Gly
 290 295 300
 Tyr Tyr Gly Gly Val Gln Phe Asp Gln Gly Thr Trp Glu Ala Asn Gly
 305 310 315 320
 Gly Leu Arg Tyr Ala Pro Arg Ala Asp Leu Ala Thr Arg Glu Glu Gln
 325 330 335
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 Pro Val Cys Ala Ala Arg Ala Gly Ala Arg
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<210> 2
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 <212> PRT
 <213> Mycobacterium tuberculosis

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Leu Lys Asn Ala Arg Thr Thr Leu Ile Ala Ala Ala Ile Ala Gly Thr
 20 25 30

Leu Val Thr Thr Ser Pro Ala Gly Ile Ala Asn Ala Asp Asp Ala Gly
 35 40 45

Leu Asp Pro Asn Ala Ala Ala Gly Pro Asp Ala Val Gly Phe Asp Pro
 50 55 60

Asn Leu Pro Pro Ala Pro Asp Ala Ala Pro Val Asp Thr Pro Pro Ala
 65 70 75 80

Pro Glu Asp Ala Gly Phe Asp Pro Asn Leu Pro Pro Pro Leu Ala Pro
 85 90 95

Asp Phe Leu Ser Pro Pro Ala Glu Glu Ala Pro Pro Val Pro Val Ala
 100 105 110

Tyr Ser Val Asn Trp Asp Ala Ile Ala Gln Cys Glu Ser Gly Gly Asn
 115 120 125

Trp Ser Ile Asn Thr Gly Asn Gly Tyr Tyr Gly Gly Leu Arg Phe Thr
 130 135 140

Ala Gly Thr Trp Arg Ala Asn Gly Gly Ser Gly Ser Ala Ala Asn Ala
 145 150 155 160

Ser Arg Glu Glu Gln Ile Arg Val Ala Glu Asn Val Leu Arg Ser Gln
 165 170 175

Gly Ile Arg Ala Trp Pro Val Cys Gly Arg Arg Gly
 180 185

<210> 3

<211> 174

<212> PRT

<213> Mycobacterium leprae

<400> 3

Met Ser Glu Ser Tyr Arg Lys Leu Thr Thr Ser Ser Ile Ile Val Ala
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Lys Ile Thr Phe Thr Gly Ala Met Leu Asp Gly Ser Ile Ala Leu Ala
 20 25 30

Gly Gln Ala Ser Pro Ala Thr Asp Ser Glu Trp Asp Gln Val Ala Arg
 35 40 45

Cys Glu Ser Gly Gly Asn Trp Ser Ile Asn Thr Gly Asn Gly Tyr Leu
 50 55 60

Gly Gly Leu Gln Phe Ser Gln Gly Thr Trp Ala Ser His Gly Gly Gly
 65 70 75 80

Glu Tyr Ala Pro Ser Ala Gln Leu Ala Thr Arg Glu Gln Gln Ile Ala
 85 90 95

Val Ala Glu Arg Val Leu Ala Thr Gln Gly Ser Gly Ala Trp Pro Ala
 100 105 110

Cys Gly His Gly Leu Ser Gly Pro Ser Leu Gln Glu Val Leu Pro Ala
 115 120 125

Gly Met Gly Ala Pro Trp Ile Asn Gly Ala Pro Ala Pro Leu Ala Pro
 130 135 140

Pro Pro Pro Ala Glu Pro Ala Pro Pro Gln Pro Pro Ala Asp Asn Phe
 145 150 155 160

Pro Pro Thr Pro Gly Asp Val Pro Ser Pro Leu Ala Arg Pro
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<210> 4

<211> 407

<212> PRT

<213> Mycobacterium tuberculosis

<400> 4

Met Ser Gly Arg His Arg Lys Pro Thr Thr Ser Asn Val Ser Val Ala
 1 5 10 15

Lys Ile Ala Phe Thr Gly Ala Val Leu Gly Gly Gly Gly Ile Ala Met
 20 25 30

Ala Ala Gln Ala Thr Ala Ala Thr Asp Gly Glu Trp Asp Gln Val Ala
 35 40 45

Arg Cys Glu Ser Gly Gly Asn Trp Ser Ile Asn Thr Gly Asn Gly Tyr
 50 55 60

Leu Gly Gly Leu Gln Phe Thr Gln Ser Thr Trp Ala Ala His Gly Gly
 65 70 75 80

Gly Glu Phe Ala Pro Ser Ala Gln Leu Ala Ser Arg Glu Gln Gln Ile
 85 90 95

Ala Val Gly Glu Arg Val Leu Ala Thr Gln Gly Arg Gly Ala Trp Pro
 100 105 110

Val Cys Gly Arg Gly Leu Ser Asn Ala Thr Pro Arg Glu Val Leu Pro
 115 120 125

Ala Ser Ala Ala Met Asp Ala Pro Leu Asp Ala Ala Val Asn Gly
 130 135 140

Glu Pro Ala Pro Leu Ala Pro Pro Pro Ala Asp Pro Ala Pro Pro Val
 145 150 155 160

Glu Leu Ala Ala Asn Asp Leu Pro Ala Pro Leu Gly Glu Pro Leu Pro
 165 170 175

Ala Ala Pro Ala Asp Pro Ala Pro Pro Ala Asp Leu Ala Pro Pro Ala
 180 185 190
 Pro Ala Asp Val Ala Pro Pro Val Glu Leu Ala Val Asn Asp Leu Pro
 195 200 205
 Ala Pro Leu Gly Glu Pro Leu Pro Ala Ala Pro Ala Asp Pro Ala Pro
 210 215 220
 Pro Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala Pro Pro Ala
 225 230 235 240
 Pro Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala Pro Pro Val
 245 250 255
 Glu Leu Ala Val Asn Asp Leu Pro Ala Pro Leu Gly Glu Pro Leu Pro
 260 265 270
 Ala Ala Pro Ala Glu Leu Ala Pro Pro Ala Asp Leu Ala Pro Ala Ser
 275 280 285
 Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala Pro Pro Ala Pro
 290 295 300
 Ala Glu Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala Pro Pro Ala Ala
 305 310 315 320
 Val Asn Glu Gln Thr Ala Pro Gly Asp Gln Pro Ala Thr Ala Pro Gly
 325 330 335
 Gly Pro Val Gly Leu Ala Thr Asp Leu Glu Leu Pro Glu Pro Asp Pro
 340 345 350
 Gln Pro Ala Asp Ala Pro Pro Pro Gly Asp Val Thr Glu Ala Pro Ala
 355 360 365
 Glu Thr Pro Gln Val Ser Asn Ile Ala Tyr Thr Lys Lys Leu Trp Gln
 370 375 380
 Ala Ile Arg Ala Gln Asp Val Cys Gly Asn Asp Ala Leu Asp Ser Leu
 385 390 395 400
 Ala Gln Pro Tyr Val Ile Gly
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<210> 5
 <211> 155
 <212> PRT
 <213> Mycobacterium leprae

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 1 5 10 15
 Lys Ser Ala Val Val Ser Gly Ile Val Thr Ala Ser Met Ala Leu Ser
 20 25 30

Thr Ser Thr Gly Met Ala Asn Ala Val Pro Arg Glu Pro Asn Trp Asp
 35 40 45
 Ala Val Ala Gln Cys Glu Ser Gly Arg Asn Trp Arg Ala Asn Thr Gly
 50 55 60
 Asn Gly Phe Tyr Gly Gly Leu Gln Phe Lys Pro Thr Ile Trp Ala Arg
 65 70 75 80
 Tyr Gly Gly Val Gly Asn Pro Ala Gly Ala Ser Arg Glu Gln Gln Ile
 85 90 95
 Thr Val Ala Asn Arg Val Leu Ala Asp Gln Gly Leu Asp Ala Trp Pro
 100 105 110
 Lys Cys Gly Ala Ala Ser Asp Leu Pro Ile Thr Leu Trp Ser His Pro
 115 120 125
 Ala Gln Gly Val Lys Gln Ile Ile Asn Asp Ile Ile Gln Met Gly Asp
 130 135 140
 Thr Thr Leu Ala Ala Ile Ala Leu Asn Gly Leu
 145 150 155

 <210> 6
 <211> 176
 <212> PRT
 <213> Mycobacterium tuberculosis

 <400> 6
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 20 25 30
 Asp Met Ser Ser Met Thr Arg Ile Ala Lys Pro Leu Ile Lys Ser Ala
 35 40 45
 Met Ala Ala Gly Leu Val Thr Ala Ser Met Ser Leu Ser Thr Ala Val
 50 55 60
 Ala His Ala Gly Pro Ser Pro Asn Trp Asp Ala Val Ala Gln Cys Glu
 65 70 75 80
 Ser Gly Gly Asn Trp Ala Ala Asn Thr Gly Asn Gly Lys Tyr Gly Gly
 85 90 95
 Leu Gln Phe Lys Pro Ala Thr Trp Ala Ala Phe Gly Gly Val Gly Asn
 100 105 110
 Pro Ala Ala Ala Ser Arg Glu Gln Gln Ile Ala Val Ala Asn Arg Val
 115 120 125

Leu Ala Glu Gln Gly Leu Asp Ala Trp Pro Thr Cys Gly Ala Ala Ser
 130 135 140

Gly Leu Pro Ile Ala Leu Trp Ser Lys Pro Ala Gln Gly Ile Lys Gln
 145 150 155 160

Ile Ile Asn Glu Ile Ile Trp Ala Gly Ile Gln Ala Ser Ile Pro Arg
 165 170 175

<210> 7
 <211> 154
 <212> PRT
 <213> *Mycobacterium tuberculosis*

<400> 7

Met Thr Pro Gly Leu Leu Thr Thr Ala Gly Ala Gly Arg Pro Arg Asp
 1 5 10 15

Arg Cys Ala Arg Ile Val Cys Thr Val Phe Ile Glu Thr Ala Val Val
 20 25 30

Ala Thr Met Phe Val Ala Leu Leu Gly Leu Ser Thr Ile Ser Ser Lys
 35 40 45

Ala Asp Asp Ile Asp Trp Asp Ala Ile Ala Gln Cys Glu Ser Gly Gly
 50 55 60

Asn Trp Ala Ala Asn Thr Gly Asn Gly Leu Tyr Gly Gly Leu Gln Ile
 65 70 75 80

Ser Gln Ala Thr Trp Asp Ser Asn Gly Gly Val Gly Ser Pro Ala Ala
 85 90 95

Ala Ser Pro Gln Gln Ile Glu Val Ala Asp Asn Ile Met Lys Thr
 100 105 110

Gln Gly Pro Gly Ala Trp Pro Lys Cys Ser Ser Cys Ser Gln Gly Asp
 115 120 125

Ala Pro Leu Gly Ser Leu Thr His Ile Leu Thr Phe Leu Ala Ala Glu
 130 135 140

Thr Gly Gly Cys Ser Gly Ser Arg Asp Asp
 145 150

<210> 8
 <211> 99
 <212> PRT
 <213> *Streptomyces coelicolor*

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<400> 8
Ile Arg Thr Ala Ala Val Thr Leu Val Ala Ala Thr Ala Leu Gly Ala
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Thr Gly Glu Ala Val Ala Ala Pro Ser Ala Pro Leu Arg Thr Asp Trp
      20          25          30

Asp Ala Ile Ala Ala Cys Glu Ser Ser Gly Asn Trp Gln Ala Asn Thr
      35          40          45

Gly Asn Gly Tyr Tyr Gly Gly Leu Gln Phe Ala Arg Ser Ser Trp Ile
      50          55          60

Ala Ala Gly Gly Leu Lys Tyr Ala Pro Arg Ala Asp Leu Ala Thr Arg
      65          70          75          80

Gly Glu Gln Ile Ala Val Ala Glu Arg Leu Ala Arg Leu Gln Gly Met
      85          90          95

Ser Ala Trp

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<210> 9
<211> 438
<212> PRT
<213> Bacillus subtilis

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Asn Leu Ser Glu Glu Lys Glu Ala Phe Phe Ile Thr Gln Lys Met Lys
    20          25          30

Lys Leu Phe Ser Val Lys Leu Ser Lys Ser Lys Val Ile Leu Val Ala
    35          40          45

Ala Cys Leu Leu Leu Ala Gly Ser Gly Thr Ala Tyr Ala Ala His Glu
    50          55          60

Leu Thr Lys Gln Ser Val Ser Val Ser Ile Asn Gly Lys Lys Lys His
    65          70          75          80

Ile Arg Thr His Ala Asn Thr Val Gly Asp Leu Leu Glu Thr Leu Asp
    85          90          95

Ile Lys Thr Arg Asp Glu Asp Lys Ile Thr Pro Ala Lys Gln Thr Lys
    100         105         110

Ile Thr Ala Asp Met Asp Val Val Tyr Glu Ala Ala Lys Pro Val Lys
    115         120         125

Leu Thr Ile Asn Gly Glu Glu Lys Thr Leu Trp Ser Thr Ala Lys Thr
    130         135         140

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Val Gly Ala Leu Leu Asp Glu Gln Asp Val Asp Val Lys Glu Gln Asp
 145 150 155 160
 Gln Ile Asp Pro Ala Ile Asp Thr Asp Ile Ser Lys Asp Met Lys Ile
 165 170 175
 Asn Ile Glu Pro Ala Phe Gln Val Thr Val Asn Asp Ala Gly Lys Gln
 180 185 190
 Lys Lys Ile Trp Thr Thr Ser Thr Val Ala Asp Phe Leu Lys Gln
 195 200 205
 Gln Lys Met Asn Ile Lys Asp Glu Asp Lys Ile Lys Pro Ala Leu Asp
 210 215 220
 Ala Lys Leu Thr Lys Gly Lys Ala Asp Ile Thr Ile Thr Arg Ile Glu
 225 230 235 240
 Lys Val Thr Asp Val Val Glu Glu Lys Ile Ala Phe Asp Val Lys Lys
 245 250 255
 Gln Glu Asp Ala Ser Leu Glu Lys Gly Lys Glu Lys Val Val Gln Lys
 260 265 270
 Gly Lys Glu Gly Lys Leu Lys Lys His Phe Glu Val Val Lys Glu Asn
 275 280 285
 Gly Lys Glu Val Ser Arg Glu Leu Val Lys Glu Glu Thr Ala Glu Gln
 290 295 300
 Ser Lys Asp Lys Val Ile Ala Val Gly Thr Lys Gln Ser Ser Pro Lys
 305 310 315 320
 Phe Glu Thr Val Ser Ala Ser Gly Asp Ser Lys Thr Val Val Ser Arg
 325 330 335
 Ser Asn Glu Ser Thr Gly Lys Val Met Thr Val Ser Ser Thr Ala Tyr
 340 345 350
 Thr Ala Ser Cys Ser Gly Cys Ser Gly His Thr Ala Thr Gly Val Asn
 355 360 365
 Leu Lys Asn Asn Pro Asn Ala Lys Val Ile Ala Val Asp Pro Asn Val
 370 375 380
 Ile Pro Leu Gly Ser Lys Val His Val Glu Gly Tyr Gly Tyr Ala Ile
 385 390 395 400
 Ile Ala Ala Asp Thr Gly Ser Ala Ile Lys Gly Asn Lys Ile Asp Val
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 Phe Phe Pro Ser Lys Ser Asp Ala Ser Asn Trp Gly Val Lys Thr Val
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 Ser Val Lys Val Leu Asn
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<210> 10
 <211> 288
 <212> PRT
 <213> Bacillus subtilis

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 Met Lys Lys Thr Ile Met Ser Phe Val Ala Val Ala Ala Leu Ser Thr
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Thr Ala Phe Gly Ala His Ala Ser Ala Lys Glu Ile Thr Val Gln Lys
 20 25 30

Gly Asp Thr Leu Trp Gly Ile Ser Gln Lys Asn Gly Val Asn Leu Lys
 35 40 45

Asp Leu Lys Glu Trp Asn Lys Leu Thr Ser Asp Lys Ile Ile Ala Gly
 50 55 60

Glu Lys Leu Thr Ile Ser Ser Glu Glu Thr Thr Thr Gly Gln Tyr
 65 70 75 80

Thr Ile Lys Ala Gly Asp Thr Leu Ser Lys Ile Ala Gln Lys Phe Gly
 85 90 95

Thr Thr Val Asn Asn Leu Lys Val Trp Asn Asn Leu Ser Ser Asp Met
 100 105 110

Ile Tyr Ala Gly Ser Thr Leu Ser Val Lys Gly Gln Ala Thr Ala Ala
 115 120 125

Asn Thr Ala Thr Glu Asn Ala Gln Thr Asn Ala Pro Gln Ala Ala Pro
 130 135 140

Lys Gln Glu Ala Val Gln Lys Glu Gln Pro Lys Gln Glu Ala Val Gln
 145 150 155 160

Gln Gln Pro Lys Gln Glu Thr Lys Ala Glu Ala Glu Thr Ser Val Asn
 165 170 175

Thr Glu Glu Lys Ala Val Gln Ser Asn Thr Asn Asn Gln Glu Ala Ser
 180 185 190

Lys Glu Leu Thr Val Thr Ala Thr Ala Tyr Thr Ala Asn Asp Gly Gly
 195 200 205

Ile Ser Gly Val Thr Ala Thr Gly Ile Asp Leu Asn Lys Asn Pro Asn
 210 215 220

Ala Lys Val Ile Ala Val Asp Pro Asn Val Ile Pro Leu Gly Ser Lys
 225 230 235 240

Val Tyr Val Glu Gly Tyr Gly Glu Ala Thr Thr Ala Ala Asp Thr Gly
 245 250 255

Gly Ala Ile Lys Gly Asn Lys Ile Asp Val Phe Val Pro Glu Lys Ser
 260 265 270

Ser Ala Tyr Arg Trp Gly Asn Lys Thr Val Lys Ile Lys Ile Leu Asn
275 280 285

<210> 11
<211> 320
<212> PRT
<213> Clostridium acetobutylicum

<220>
<221> MOD_RES
<222> (2)..(3)
<223> Variable amino acid

<400> 11
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20 25 30

Ser Lys Ile Ile Thr Tyr Lys Ser Asn Glu Gly Ser Ile Leu Ser Lys
35 40 45

Asn Asn Ile Leu Val Gly Pro Lys Asp Lys Ile Gln Pro Ala Leu Asp
50 55 60

Thr Asn Leu Lys Asn Gly Asp Lys Ile Tyr Ile Lys Lys Ala Ile Ser
65 70 75 80

Val Glu Val Ala Val Asp Gly Lys Val Arg Arg Val Lys Ser Ser Glu
85 90 95

Glu Thr Val Ser Lys Met Leu Lys Ala Glu Lys Ile Pro Leu Ser Lys
100 105 110

Val Asp Lys Val Asn Ile Ser Arg Asn Ala Ala Ile Lys Lys Asn Met
115 120 125

Lys Ile Ser Ile Thr Arg Val Asn Ser Gln Ile Thr Lys Glu Asn Gln
130 135 140

Gln Val Asp Phe Pro Thr Glu Val Ile Ser Asp Asp Ser Met Gly Asn
145 150 155 160

Asp Glu Lys Gln Val Ile Gln Gln Gly Gln Ala Gly Glu Lys Glu Val
165 170 175

Phe Thr Lys Ile Val Tyr Glu Asp Gly Lys Ala Val Ser Lys Glu Ile
180 185 190

Val Gly Glu Val Ile Lys Lys Glu Pro Thr Lys Gln Val Phe Lys Val
195 200 205

Gly Thr Leu Gly Val Leu Lys Pro Asp Arg Gly Gly Arg Val Leu Tyr
 210 215 220
 Lys Lys Ser Leu Gln Val Leu Ala Thr Ala Tyr Thr Asp Asp Phe Ser
 225 230 235 240
 Phe Gly Ile Thr Ala Ser Gly Thr Lys Val Lys Arg Asp Ser Asp Gly
 245 250 255
 Tyr Ser Ser Ile Ala Val Asp Pro Thr Val Ile Pro Leu Gly Thr Lys
 260 265 270
 Leu Tyr Val Pro Gly Tyr Gly Tyr Val Val Ala Glu Asp Thr Gly
 275 280 285
 Gly Ala Ile Lys Gly Asn Arg Leu Asp Leu Phe Phe Thr Ser Glu Arg
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 Glu Cys Tyr Asp Trp Gly Ala Lys Asn Val Thr Val Tyr Ile Leu Lys
 305 310 315 320

<210> 12
 <211> 81
 <212> PRT
 <213> Clostridium perfringens

<400> 12
 Ala Glu Ala Tyr Thr Ala Ser Gly Met His Val Leu Arg Asp Pro Asn
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Gly Tyr Ser Thr Ile Ala Val Asp Pro Ser Val Ile Pro Leu Gly Thr
 20 25 30

Lys Leu Tyr Val Glu Gly Tyr Gly Tyr Ala Ile Ile Ala Ala Asp Thr
 35 40 45

Gly Gly Ala Ile Lys Gly Asn Arg Val Asp Leu Phe Phe Asn Thr Glu
 50 55 60

Ala Glu Ala Ser Asn Trp Gly Val Arg Asn Leu Asp Val Tyr Ile Leu
 65 70 75 80

Asn

<210> 13
 <211> 51
 <212> PRT
 <213> Unknown Organism

<220>

<223> Description of Unknown Organism: RP-factor
C-terminal domain peptide

<400> 13

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35 40 45Pro Gln Ala
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<210> 14

<211> 46

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 14

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1 5 10 15Tyr Asp Thr Thr Ile Ser Ala Leu Lys Ser Glu Asn Lys Leu Lys Ser
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35 40 45

<210> 15

<211> 44

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 15

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<210> 16
<211> 43
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical wall-associated protein fragment

<400> 16
Thr Tyr Thr Val Lys Ser Gly Asp Ser Leu Trp Val Ile Ala Gln Lys
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Phe Asn Val Thr Ala Gln Gln Ile Arg Glu Lys Asn Asn Leu Lys Thr
20 25 30

Asp Val Leu Gln Val Gly Gln Lys Leu Val Ile
35 40

<210> 17
<211> 43
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical wall-associated protein fragment

<400> 17
Lys Tyr Thr Val Lys Ser Gly Asp Ser Leu Trp Lys Ile Ala Asn Asn
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Ile Asn Leu Thr Val Gln Gln Ile Arg Asn Ile Asn Asn Leu Lys Ser
20 25 30

Asp Val Leu Tyr Val Gly Gln Val Leu Lys Leu
35 40

<210> 18
<211> 45
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical wall-associated protein fragment

<400> 18
Thr Tyr Thr Val Lys Ser Gly Asp Thr Ile Trp Ala Leu Ser Ser Lys
1 5 10 15

Tyr Gly Thr Ser Val Gln Asn Ile Met Ser Trp Asn Asn Leu Ser Ser
20 25 30

Ser Ser Ile Tyr Val Gly Gln Val Leu Ala Val Lys Gln
35 40 45

<210> 19
<211> 45
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 19
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1 5 10 15

Tyr Gly Val Ser Val Gln Asp Ile Met Ser Trp Asn Asn Leu Ser Ser
20 25 30

Ser Ser Ile Tyr Val Gly Gln Lys Leu Ala Ile Lys Gln
35 40 45

<210> 20
<211> 46
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 20
Ser Val Lys Val Lys Ser Gly Asp Thr Leu Trp Ala Leu Ser Val Lys
1 5 10 15

Tyr Lys Thr Ser Ile Ala Gln Leu Lys Ser Trp Asn His Leu Ser Ser
20 25 30

Asp Thr Ile Tyr Ile Gly Gln Asn Leu Ile Val Ser Gln Ser
35 40 45

<210> 21
<211> 43
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 21
Thr Tyr Thr Val Lys Ser Gly Asp Thr Leu Trp Gly Ile Ser Gln Arg
1 5 10 15

Tyr Gly Ile Ser Val Ala Gln Ile Gln Ser Ala Asn Asn Leu Lys Ser
 20 25 30

Thr Ile Ile Tyr Ile Gly Gln Lys Leu Leu Leu
 35 40

<210> 22
<211> 60
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 22
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Phe Tyr Gly Asn Ser Thr Gln Trp Arg Lys Ile Trp Asn Ala Asn Lys
20 25 30

Thr Ala Met Ile Lys Arg Ser Lys Arg Asn Ile Arg Gln Pro Gly His
 35 40 45

Trp Ile Phe Pro Gly Gln Lys Leu Lys Ile Pro Gln
50 55 60

<210> 23
<211> 60
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Hypothetical
wall-associated protein fragment

<400> 23
Thr Tyr Thr Val Lys Lys Gly Asp Thr Leu Trp Asp Leu Ala Gly Lys
1 5 10 15

Phe Tyr Gly Asp Ser Thr Lys Trp Arg Lys Ile Trp Lys Val Asn Lys
 20 25 30

Lys Ala Met Ile Lys Arg Ser Lys Arg Asn Ile Arg Gln Pro Gly His
35 40 45

Trp Ile Phe Pro Gly Gln Lys Leu Lys Ile Pro Gln
50 55 60

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<210> 24  
<211> 167  
<212> PRT  
<213> Mycobacterium tuberculosis
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<400> 24

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Glu Pro Leu Pro Ala Ala Pro Ala Asp Pro Ala Pro Pro Pro Ala Asp Leu
20 25 30

Ala Pro Pro Ala Pro Ala Asp Val Ala Pro Pro Val Glu Leu Ala Val
35 40 45

Asn Asp Leu Pro Ala Pro Leu Gly Glu Pro Leu Pro Ala Ala Pro Ala
50 55 60

Asp Pro Ala Pro Pro Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu
65 70 75 80

Ala Pro Pro Ala Pro Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu
85 90 95

Ala Pro Pro Val Glu Leu Ala Val Asn Asp Leu Pro Ala Pro Leu Gly
100 105 110

Glu Pro Leu Pro Ala Ala Pro Ala Glu Leu Ala Pro Pro Ala Asp Leu
 115 120 125

Ala Pro Ala Ser Ala Asp Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala
130 135 140

Pro Pro Ala Pro Ala Glu Leu Ala Pro Pro Ala Pro Ala Asp Leu Ala
145 150 155 160

<210> 25
<211> 11
<212> PRT

<400> 25

Ala Pro P:

1 5
<210> 26
<211> 11
<212> PRT
<213> *Mycobacterium tuberculosis*

-100- 36

<400> 26

Ala Pro P₁

<210> 27
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<213> *Mycobacterium tuberculosis*

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Pro Ala Pro Leu Gly Glu Pro Leu Pro Ala Ala Pro Ala Asp Leu
1 5 10 15

<210> 28
<211> 14
<212> PRT
<213> *Mycobacterium tuberculosis*

<400> 28
Pro Ala Pro Leu Gly Glu Pro Leu Pro Ala Ala Pro Ala Glu
1 5 10

<210> 29
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<212> PRT
<213> *Mycobacterium tuberculosis*

<400> 29
Pro Ala Pro Pro Ala Asp Leu
1 5

<210> 30
<211> 8
<212> PRT
<213> *Mycobacterium tuberculosis*

<400> 30
Ala Pro Pro Ala Pro Ala Asp Leu
1 5

<210> 31
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<212> PRT
<213> *Mycobacterium tuberculosis*

<400> 31
Ala Pro Pro Ala Pro Ala Asp Val
1 5

<210> 32
<211> 8
<212> PRT
<213> *Mycobacterium tuberculosis*

<400> 32
 Ala Pro Pro Ala Pro Ala Glu Leu
 1 5

<210> 33
 <211> 8
 <212> PRT
 <213> *Mycobacterium tuberculosis*

<400> 33
 Ala Pro Pro Ala Pro Ala Glu Val
 1 5

<210> 34
 <211> 478
 <212> PRT
 <213> *Listeria monocytogenes*

<400> 34
 Met Asn Met Lys Lys Ala Thr Ile Ala Ala Thr Ala Gly Ile Ala Val
 1 5 10 15

Thr Ala Phe Ala Ala Pro Thr Ile Ala Ser Ala Ser Thr Val Val Val
 20 25 30

Glu Ala Gly Asp Thr Leu Trp Gly Ile Ala Gln Ser Lys Gly Thr Thr
 35 40 45

Val Asp Ala Ile Lys Lys Ala Asn Asn Leu Thr Thr Asp Lys Ile Val
 50 55 60

Pro Gly Gln Lys Leu Gln Val Asn Asn Glu Val Ala Ala Ala Glu Lys
 65 70 75 80

Thr Glu Lys Ser Val Ser Ala Thr Trp Leu Asn Val Arg Thr Gly Ala
 85 90 95

Gly Val Asp Asn Ser Ile Ile Thr Ser Ile Lys Gly Gly Thr Lys Val
 100 105 110

Thr Val Glu Thr Thr Glu Ser Asn Gly Trp His Lys Ile Thr Tyr Asn
 115 120 125

Asp Gly Lys Thr Gly Phe Val Asn Gly Lys Tyr Leu Thr Asp Lys Ala
 130 135 140

Val Ser Thr Pro Val Ala Pro Thr Gln Glu Val Lys Lys Glu Thr Thr
 145 150 155 160

Thr Gln Gln Ala Ala Pro Val Ala Glu Thr Lys Thr Glu Val Lys Gln
 165 170 175

Thr Thr Gln Ala Thr Thr Pro Ala Pro Lys Val Ala Glu Thr Lys Glu
 180 185 190

Thr Pro Val Ile Asp Gln Asn Ala Thr Thr His Ala Val Lys Ser Gly
 195 200 205

Asp Thr Ile Trp Ala Leu Ser Val Lys Tyr Gly Val Ser Val Gln Asp
 210 215 220

Ile Met Ser Trp Asn Asn Leu Ser Ser Ser Ile Tyr Val Gly Gln
 225 230 235 240

Lys Leu Ala Ile Lys Gln Thr Ala Asn Thr Ala Thr Pro Lys Ala Glu
 245 250 255

Val Lys Thr Glu Ala Pro Ala Ala Glu Lys Gln Ala Ala Pro Val Val
 260 265 270

Lys Glu Asn Thr Asn Thr Asn Thr Ala Thr Thr Glu Lys Lys Glu Thr
 275 280 285

Ala Thr Gln Gln Gln Thr Ala Pro Lys Ala Pro Thr Glu Ala Ala Lys
 290 295 300

Pro Ala Pro Ala Pro Ser Thr Asn Thr Asn Ala Asn Lys Thr Asn Thr
 305 310 315 320

Asn Thr Asn Thr Asn Asn Thr Asn Thr Pro Ser Lys Asn Thr Asn Thr
 325 330 335

Asn Ser Asn Thr Asn Thr Asn Ser Asn Asn Thr Asn Ala Asn Gln
 340 345 350

Gly Ser Ser Asn Asn Ser Asn Ser Ser Ala Ser Ala Ile Ile Ala
 355 360 365

Glu Ala Gln Lys His Leu Gly Lys Ala Tyr Ser Trp Gly Gly Asn Gly
 370 375 380

Pro Thr Thr Phe Asp Cys Ser Gly Tyr Thr Lys Tyr Val Phe Ala Lys
 385 390 395 400

Ala Gly Ile Ser Leu Pro Arg Thr Ser Gly Ala Gln Tyr Ala Ser Thr
 405 410 415

Thr Arg Ile Ser Glu Ser Gln Ala Lys Pro Gly Asp Leu Val Phe Phe
 420 425 430

Asp Tyr Gly Ser Gly Ile Ser His Val Gly Ile Tyr Val Gly Asn Gly
 435 440 445

Gln Met Ile Asn Ala Gln Asp Asn Gly Val Lys Tyr Asp Asn Ile His
 450 455 460

Gly Ser Gly Trp Gly Lys Tyr Leu Val Gly Phe Gly Arg Val
 465 470 475

<210> 35
 <211> 758

<212> DNA
 <213> Micrococcus luteus

<220>

<221> CDS

<222> (66)..(728)

<400> 35

accaaggaga aggacgaccc cggtgtgcct cggccgccga tcagcgagga ctcgccatgg 60

| | | | | | | | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| acacc | atg | act | ctc | tcc | acc | act | tcc | gcc | acc | cgc | tcc | cgc | cgt | gcc | acc | 110 |
| Met | Thr | Leu | Phe | Thr | Thr | Ser | Ala | Thr | Arg | Ser | Arg | Arg | Arg | Ala | Thr | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gcc | tcg | atc | gtc | gcf | ggc | atg | acc | ctc | gcc | ggc | gcc | gcc | gtg | ggc | 158 |
| Ala | Ser | Ile | Val | Ala | Gly | Met | Thr | Leu | Ala | Gly | Ala | Ala | Ala | Val | Gly |
| 20 | | | | | | 25 | | | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ttc | tcc | gcc | ccg | gcc | cag | gcc | acc | gtg | gac | acc | tgg | gac | cgc | ctc | 206 |
| Phe | Ser | Ala | Pro | Ala | Gln | Ala | Ala | Thr | Val | Asp | Thr | Trp | Asp | Arg | Leu |
| 35 | | | | | | 40 | | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gcc | gag | tgc | gag | tcc | aac | ggc | acc | tgg | gac | atc | acc | acc | ggc | 254 | |
| Ala | Glu | Cys | Glu | Ser | Asn | Gly | Thr | Trp | Asp | Ile | Asn | Thr | Gly | Asn | Gly |
| 50 | | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ttc | tac | ggc | ggc | gtg | cag | ttc | acc | ctg | tcc | tgg | cag | gcc | gtc | ggc | 302 |
| Phe | Tyr | Gly | Gly | Val | Gln | Phe | Thr | Leu | Ser | Ser | Trp | Gln | Ala | Val | Gly |
| 65 | | | | | | 70 | | | | | 75 | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggc | gaa | ggc | tac | ccg | cac | cag | gcc | tgc | aag | gcc | gag | cag | atc | aag | cgc | 350 |
| Gly | Glu | Gly | Tyr | Pro | His | Gln | Ala | Ser | Lys | Ala | Glu | Gln | Ile | Lys | Arg | |
| 80 | | | | | | 85 | | | | 90 | | | 95 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gcc | gag | atc | ctc | cag | gac | ctg | cag | ggc | tgg | ggc | gcg | tgg | ccg | ctg | tgc | 398 |
| Ala | Glu | Ile | Leu | Gln | Asp | Leu | Gln | Gly | Trp | Gly | Ala | Trp | Pro | Leu | Cys | |
| 100 | | | | | | 105 | | | | | 110 | | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tcg | cag | aag | ctg | ggc | ctg | acc | cag | gct | gac | gac | ggc | ggt | gac | gtg | 446 |
| Ser | Gln | Lys | Leu | Gly | Leu | Thr | Gln | Ala | Asp | Ala | Asp | Ala | Gly | Asp | Val |
| 115 | | | | | | 120 | | | | | 125 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gac | gcc | acc | gag | gcc | ccg | gtc | gcc | gtg | gag | cgc | acg | gcc | acc | gtg | 494 |
| Asp | Ala | Thr | Glu | Ala | Ala | Pro | Val | Ala | Val | Glu | Arg | Thr | Ala | Thr | Val |
| 130 | | | | | | 135 | | | | 140 | | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cag | cgc | cag | tcc | gcc | gcf | gac | gag | gct | gcc | gag | cag | gcc | gct | gcc | 542 |
| Gln | Arg | Gln | Ser | Ala | Ala | Asp | Glu | Ala | Ala | Glu | Gln | Ala | Ala | Ala | |
| 145 | | | | | | 150 | | | | 155 | | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gcg | gag | cag | gcc | gtc | gcc | gag | gcc | gag | acc | atc | gtc | gtc | aag | tcc | 590 |
| Ala | Glu | Gln | Ala | Val | Ala | Glu | Ala | Glu | Thr | Ile | Val | Val | Lys | Ser | |
| 160 | | | | | | 165 | | | 170 | | 175 | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggt | gac | tcc | ctc | tgg | acg | ctc | gcc | aac | gag | tac | gag | gtg | gag | ggt | ggc | 638 |
| Gly | Asp | Ser | Leu | Trp | Thr | Leu | Ala | Asn | Glu | Tyr | Glu | Val | Glu | Gly | Gly | |
| 180 | | | | | | 185 | | | | | 190 | | | | | |

| | |
|---|-----|
| tgg acc gcc ctc tac gag gcc aac aag ggc gcc gtc tcc gac gcc gcc | 686 |
| Trp Thr Ala Leu Tyr Glu Ala Asn Lys Gly Ala Val Ser Asp Ala Ala | |
| 195 | 200 |
| 205 | |
| gtg atc tac gtc ggc cag gag ctc gtc ctg ccg cag gcc tga | 728 |
| Val Ile Tyr Val Gly Gln Glu Leu Val Leu Pro Gln Ala | |
| 210 | 215 |
| 220 | |
| gacgcctgac cggccccccg gaccggtacc | 758 |
| | |
| <210> 36 | |
| <211> 220 | |
| <212> PRT | |
| <213> Micrococcus luteus | |
| | |
| <400> 36 | |
| Met Thr Leu Phe Thr Thr Ser Ala Thr Arg Ser Arg Arg Ala Thr Ala | |
| 1 | 5 |
| 10 | 15 |
| Ser Ile Val Ala Gly Met Thr Leu Ala Gly Ala Ala Ala Val Gly Phe | |
| 20 | 25 |
| 30 | |
| Ser Ala Pro Ala Gln Ala Ala Thr Val Asp Thr Trp Asp Arg Leu Ala | |
| 35 | 40 |
| 45 | |
| Glu Cys Glu Ser Asn Gly Thr Trp Asp Ile Asn Thr Gly Asn Gly Phe | |
| 50 | 55 |
| 60 | |
| Tyr Gly Gly Val Gln Phe Thr Leu Ser Ser Trp Gln Ala Val Gly Gly | |
| 65 | 70 |
| 75 | 80 |
| Glu Gly Tyr Pro His Gln Ala Ser Lys Ala Glu Gln Ile Lys Arg Ala | |
| 85 | 90 |
| 95 | |
| Glu Ile Leu Gln Asp Leu Gln Gly Trp Gly Ala Trp Pro Leu Cys Ser | |
| 100 | 105 |
| 110 | |
| Gln Lys Leu Gly Leu Thr Gln Ala Asp Ala Asp Ala Gly Asp Val Asp | |
| 115 | 120 |
| 125 | |
| Ala Thr Glu Ala Ala Pro Val Ala Val Glu Arg Thr Ala Thr Val Gln | |
| 130 | 135 |
| 140 | |
| Arg Gln Ser Ala Ala Asp Glu Ala Ala Glu Gln Ala Ala Ala Ala | |
| 145 | 150 |
| 155 | 160 |
| Glu Gln Ala Val Val Ala Glu Ala Glu Thr Ile Val Val Lys Ser Gly | |
| 165 | 170 |
| 175 | |
| Asp Ser Leu Trp Thr Leu Ala Asn Glu Tyr Glu Val Glu Gly Gly Trp | |
| 180 | 185 |
| 190 | |
| Thr Ala Leu Tyr Glu Ala Asn Lys Gly Ala Val Ser Asp Ala Ala Val | |
| 195 | 200 |
| 205 | |

Ile Tyr Val Gly Gln Glu Leu Val Leu Pro Gln Ala
 210 215 220

<210> 37
 <211> 33
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

 <400> 37
 gcsacsgtsg acacstggga ccgsctsgcs gag

33

<210> 38
 <211> 19
 <212> PRT
 <213> Micrococcus luteus

 <220>
 <221> MOD_RES
 <222> (13)
 <223> Variable amino acid

 <220>
 <221> MOD_RES
 <222> (18)
 <223> Variable amino acid

 <400> 38
 Ala Thr Val Asp Thr Trp Asp Arg Leu Ala Glu Glu Xaa Ser Asn Gly
 1 5 10 15

 Thr Xaa Asp

<210> 39
 <211> 18
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

 <400> 39
 ccgccgtaga agccgttg

18

<210> 40
 <211> 19

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 40
 agttcacccct gtcctcctg

19

<210> 41
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<220>
 <221> modified_base
 <222> (9)
 <223> i

<220>
 <221> modified_base
 <222> (15)
 <223> i

<220>
 <221> modified_base
 <222> (21)
 <223> i

<400> 41
 gcytgrtgng grtanccytc ncc

23

<210> 42
 <211> 12
 <212> PRT
 <213> Micrococcus luteus

<400> 42
 Val Gly Gly Glu Gly Tyr Pro His Gln Ala Ser Lys
 1 5 10

<210> 43
 <211> 182
 <212> PRT
 <213> Micrococcus luteus

<400> 43
 Ala Thr Val Asp Thr Trp Asp Arg Leu Ala Glu Cys Glu Ser Asn Gly
 1 5 10 15

Thr Trp Asp Ile Asn Thr Gly Asn Gly Phe Tyr Gly Gly Val Gln Phe
 20 25 30

Thr Leu Ser Ser Trp Gln Ala Val Gly Gly Glu Gly Tyr Pro His Gln
 35 40 45

Ala Ser Lys Ala Glu Gln Ile Lys Arg Ala Glu Ile Leu Gln Asp Leu
 50 55 60

Gln Gly Trp Gly Ala Trp Pro Leu Cys Ser Gln Lys Leu Gly Leu Thr
 65 70 75 80

Gln Ala Asp Ala Asp Ala Gly Asp Val Asp Ala Thr Glu Ala Ala Pro
 85 90 95

Val Ala Val Glu Arg Thr Ala Thr Val Gln Arg Gln Ser Ala Ala Asp
 100 105 110

Glu Ala Ala Ala Glu Gln Ala Ala Ala Ala Glu Gln Ala Val Val Ala
 115 120 125

Glu Ala Glu Thr Ile Val Val Lys Ser Gly Asp Ser Leu Trp Thr Leu
 130 135 140

Ala Asn Glu Tyr Glu Val Glu Gly Gly Trp Thr Ala Leu Tyr Glu Ala
 145 150 155 160

Asn Lys Gly Ala Val Ser Asp Ala Ala Val Ile Tyr Val Gly Gln Glu
 165 170 175

Leu Val Leu Pro Gln Ala
 180

<210> 44
 <211> 299
 <212> DNA
 <213> Streptomyces coelicolor

<220>
 <221> CDS
 <222> (3) .. (299)

<400> 44
 gg atc cgc acc gcc gcg gta acc ctg gtc gcc gcg acc gca ctc ggg 47
 Ile Arg Thr Ala Ala Val Thr Leu Val Ala Ala Thr Ala Leu Gly
 1 5 10 15

gcg acc ggc gaa gcg gtg gcc gcg ccc tcg gcg ccc ctg cgc acc gac 95
 Ala Thr Gly Glu Ala Val Ala Ala Pro Ser Ala Pro Leu Arg Thr Asp
 20 25 30

tgg gac gcc atc gcc gcg tgc gag tcc agc ggc aac tgg cag gcg aac 143
 Trp Asp Ala Ile Ala Ala Cys Glu Ser Ser Gly Asn Trp Gln Ala Asn
 35 40 45

acc ggc aac ggc tac tac ggc ggc ctg cag ttc gca cgg tcc agc tgg 191
 Thr Gly Asn Gly Tyr Tyr Gly Gly Leu Gln Phe Ala Arg Ser Ser Trp
 50 55 60

atc gcc gcc ggc ggc ctc aag tac gcc ccg cgc gcg gac ctc gcc acc 239
 Ile Ala Ala Gly Gly Leu Lys Tyr Ala Pro Arg Ala Asp Leu Ala Thr
 65 70 75

cgc ggc gag cag atc gcc gtg gcg gaa cgc ctc gcc cgt ctg cag ggg 287
 Arg Gly Glu Gln Ile Ala Val Ala Glu Arg Leu Ala Arg Leu Gln Gly
 80 85 90 95

atg tcc gcc tgg 299
 Met Ser Ala Trp

<210> 45

<211> 99

<212> PRT

<213> Streptomyces coelicolor

<400> 45

Ile Arg Thr Ala Ala Val Thr Leu Val Ala Ala Thr Ala Leu Gly Ala
 1 5 10 15

Thr Gly Glu Ala Val Ala Ala Pro Ser Ala Pro Leu Arg Thr Asp Trp
 . 20 25 30

Asp Ala Ile Ala Ala Cys Glu Ser Ser Gly Asn Trp Gln Ala Asn Thr
 35 40 45

Gly Asn Gly Tyr Tyr Gly Gly Leu Gln Phe Ala Arg Ser Ser Trp Ile
 50 55 60

Ala Ala Gly Gly Leu Lys Tyr Ala Pro Arg Ala Asp Leu Ala Thr Arg
 65 70 75 80

Gly Glu Gln Ile Ala Val Ala Glu Arg Leu Ala Arg Leu Gln Gly Met
 85 90 95

Ser Ala Trp

<210> 46

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 46

gtcagaattc atatggccac cgtggacacc tggg

34

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<210> 47
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 47
tgacggatcc tattaggcct gcggcaggac gag 33

<210> 48
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 48
atcagaattc atatggacga catcgattgg gacgc 35

<210> 49
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 49
cgcaggatcc cctcaatcgt ccctgctcc 29

<210> 50
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 50
gaagagaatt cttccatca cga 23

<210> 51
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
```

```

<400> 51
ccaaacgaat tcggtaatc ac 22

<210> 52
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 52
gcaaggatcc cagactaaaa aaacag 26

<210> 53
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 53
atcaggatcc atattatttag tttaaga 27

<210> 54
<211> 663
<212> DNA
<213> Micrococcus luteus

<220>
<221> CDS
<222> (1)..(663)

<400> 54
atg act ctc ttc acc act tcc gcc acc cgc tcc cgc cgt gcc acc gcc 48
Met Thr Leu Phe Thr Ser Ala Thr Arg Ser Arg Arg Ala Thr Ala
    1           5           10          15

tcg atc gtc gcg ggc atg acc ctc gcc ggc gcc gcc gtg ggc ttc 96
Ser Ile Val Ala Gly Met Thr Leu Ala Gly Ala Ala Val Gly Phe
    20          25          30

tcc gcc ccg gcc cag gcc acc gtg gac acc tgg gac cgc ctc gcc 144
Ser Ala Pro Ala Gln Ala Ala Thr Val Asp Thr Trp Asp Arg Leu Ala
    35          40          45

gag tgc gag tcc aac ggc acc tgg gac atc aac acc ggc aac ggc ttc 192
Glu Cys Glu Ser Asn Gly Thr Trp Asp Ile Asn Thr Gly Asn Gly Phe
    50          55          60

tac ggc ggc gtg cag ttc acc ctg tcc tcc tgg cag gcc gtc ggc ggc 240
Tyr Gly Gly Val Gln Phe Thr Leu Ser Ser Trp Gln Ala Val Gly Gly
    65          70          75          80

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| | |
|---|-----|
| gaa ggc tac ccg cac cag gcc tcg aag gcc gag cag atc aag cgc gcc | 288 |
| Glu Gly Tyr Pro His Gln Ala Ser Lys Ala Glu Gln Ile Lys Arg Ala | |
| 85 | 90 |
| 95 | |
| gag atc ctc cag gac ctg cag ggc tgg ggc gcg tgg ccg ctg tgc tcg | 336 |
| Glu Ile Leu Gln Asp Leu Gln Gly Trp Gly Ala Trp Pro Leu Cys Ser | |
| 100 | 105 |
| 110 | |
| cag aag ctg ggc ctg acc cag gct gac gcg gac gcc ggt gac gtg gac | 384 |
| Gln Lys Leu Gly Leu Thr Gln Ala Asp Ala Asp Ala Gly Asp Val Asp | |
| 115 | 120 |
| 125 | |
| gcc acc gag gcc gcc ccg gtc gcc gtg gag cgc acg gcc acc gtg cag | 432 |
| Ala Thr Glu Ala Ala Pro Val Ala Val Glu Arg Thr Ala Thr Val Gln | |
| 130 | 135 |
| 140 | |
| cgc cag tcc gcc gcg gac gag gct gcc gag cag gcc gct gcc gcg | 480 |
| Arg Gln Ser Ala Ala Asp Glu Ala Ala Ala Glu Gln Ala Ala Ala Ala | |
| 145 | 150 |
| 155 | 160 |
| gag cag gcc gtc gtc gcc gag gcc gag acc atc gtc gtc aag tcc ggt | 528 |
| Glu Gln Ala Val Val Ala Glu Ala Glu Thr Ile Val Val Lys Ser Gly | |
| 165 | 170 |
| 175 | |
| gac tcc ctc tgg acg ctc gcc aac gag tac gag gtg gag ggt ggc tgg | 576 |
| Asp Ser Leu Trp Thr Leu Ala Asn Glu Tyr Glu Val Glu Gly Gly Trp | |
| 180 | 185 |
| 190 | |
| acc gcc ctc tac gag gcc aac aag ggc gcc gtc tcc gac gcc gcc gtg | 624 |
| Thr Ala Leu Tyr Glu Ala Asn Lys Gly Ala Val Ser Asp Ala Ala Val | |
| 195 | 200 |
| 205 | |
| atc tac gtc ggc cag gag ctc gtc ctg ccg cag gcc tga | 663 |
| Ile Tyr Val Gly Gln Glu Leu Val Leu Pro Gln Ala | |
| 210 | 215 |
| 220 | |

<210> 55
<211> 6
<212> PRT
<213> Mycobacterium tuberculosis

<400> 55
Ala Pro Pro Ala Asp Leu
1 5

<210> 56
<211> 7
<212> PRT
<213> Mycobacterium tuberculosis

<400> 56
Ala Pro Ala Ser Ala Asp Leu
1 5

<210> 57
<211> 8
<212> PRT
<213> Mycobacterium tuberculosis

<400> 57
Ala Pro Pro Ala Pro Ala Glu Leu
1 5

<210> 58
<211> 4
<212> PRT
<213> Mycobacterium tuberculosis

<400> 58
Ala Pro Pro Ala
1

<210> 59
<211> 4
<212> PRT
<213> Mycobacterium tuberculosis

<400> 59
Ala Val Asn Glu
1

<210> 60
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<220>
<221> MOD_RES
<222> (14)
<223> Asp or Glu

<400> 60
Pro Ala Pro Leu Gly Glu Pro Leu Pro Ala Ala Pro Ala Xaa Leu
1 5 10 15

<210> 61
<211> 8
<212> PRT
<213> Mycobacterium tuberculosis

<220>
<221> MOD_RES
<222> (7)
<223> Asp or Glu

<220>
<221> MOD_RES
<222> (8)
<223> Leu or Val

<400> 61
Ala Pro Pro Ala Pro Ala Xaa Xaa
1 5

<210> 62
<211> 11
<212> PRT
<213> Mycobacterium tuberculosis

<220>
<221> MOD_RES
<222> (8)
<223> Ala or Val

<400> 62
Ala Pro Pro Val Glu Leu Ala Xaa Asn Asp Leu
1 5 10